

an exit-side manifold with curved branches connected to another set of said joint ends of said two flow tubes, said exit-side manifold with curved branches converging flows of said fluid being measured flowing in said two flow tubes into an outlet port to discharge said fluid being measured;

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a drive unit for driving and resonating one of said flow tubes with another of said flow tubes at mutually opposite phases; and

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a pair of oscillation sensors installed along said two parallel flow tubes curved into an arch shape at locations horizontally symmetrical with respect to an installation location of said drive unit for sensing a phase difference proportional to a Coriolis force, said two flow tubes being connected to said entry-side manifold and to said exit-side manifold at respective said joint ends and said two flow tubes being formed into the arch shape that is bent in only one direction, said entry-side manifold curved branches being smoothly bent from an inlet direction of said entry-side manifold to a connection direction at an end of said two manifold outlets that is the same as the end direction of said joint ends, said exit-side manifold curved branches being smoothly bent from an outlet direction of said exit-side manifold to a connection direction at an end of said two manifold inlets that is the same as the end direction of said joint ends.

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Claim 3 has not been changed by this amendment as remains as follows:

3. A Coriolis mass flow meter as set forth in claim 1 wherein:

a pressure-resistant case is arranged around said two flow tubes;

said entry-side and exit-side manifolds have a pair of integrally formed disc-shaped

flanges, to which both ends of said pressure-resistant case are fixedly fitted;

5 the cross-sectional shape of said pressure-resistant case being an oval shape with the major axis oriented in the curved direction of said flow tubes, with the length of said major axis smoothly and gradually reduced from the axial central part thereof to both ends thereof into a substantially circular shape over a predetermined length near both ends.

Please amend Claim 5 as follows:

5. (AMENDED) A Coriolis mass flow meter comprising:

two flow tubes each having a curve and each flow tube having first and second joint ends, each curve of said flow tubes lying in a respective plane, said planes of said curves of said flow tubes being arranged substantially parallel, said each curve being in only one direction and forming an arch extending fully from a respective said first joint end to a respective second joint end;

an entry-side manifold with an inlet port portion and two outlet ports forming branches curved with respect to the inlet port portion, said two outlet port branches being connected to said first joint ends of said two flow tubes and dividing an entry passage from said inlet port into said branches joined to said two flow tubes, said entry passages having a smooth curve from said inlet port to said outlet ports with an axial direction of each of said outlet ports at an acute angle relative to said an axial direction of said inlet port, an axial direction of said entry passage at said outlet ports being in a substantially same direction as an axial direction of a respective said flow tube at said respective first joint end of said respective flow tube;

15 an exit-side manifold with an outlet port portion and two inlet port branches, said inlet
port branches being connected to said second joint ends of said two flow tubes and joining exit
passages from said inlet ports to said outlet port portion, each of said exit passages having a
smooth curve from respective said inlet ports to said outlet port with an axial direction of each
of said inlet ports at an acute angle relative to an axial direction of said outlet port portion, an
20 axial direction of said exit passages at said inlet ports being in a substantially same direction as
an axial direction of a respective said flow tube at said respective second joint end of said
respective flow tube;

a drive unit for driving and resonating one of said flow tubes with respect to another
of said flow tubes at mutually opposite phases;

25 a pair of oscillation sensors installed at locations symmetrical with respect to said drive
unit for sensing a phase difference proportional to a Coriolis force of fluid in said two flow
tubes.

Claim 6 has not been amended by this amendment and remains as follows:

6. A meter in accordance with claim 5, wherein:
said axial directions of said first joint ends is non-parallel with said axial directions of
said second joint ends.

Claim 7 has not been amended by this amendment and remains as follows:

7. A meter in accordance with claim 5, wherein:

said axial directions of said first joint ends is angularly spaced from said axial directions of said second joint ends.

Claim 8 has not been amended by this amendment and remains as follows:

8. A meter in accordance with claim 5, further comprising:

a sealed pressure case surrounding said two flow tubes, said pressure case having a cylindrical shape with ends of said cylindrical shape closed by end plates and forming corners with said cylindrical shape, said entry and exit manifolds being arranged in said corners of said case.

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Claim 9 has not been amended by this amendment and remains as follows:

9. A meter in accordance with claim 8, wherein:

said end plates are flanges of said entry and exit manifolds;

a radial cross section of said pressure case has an oval shape with a major axis of said oval shape being oriented in a curved direction of said flow tubes, a length of said major axis being a maximum at a central portion of said pressure case and diminishing toward said ends of said cylindrical shape to have said cross section of said pressure case change to a substantially circular shape at said ends of said cylindrical shape.

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Claim 10 has not been amended by this amendment and remains as follows:

10. A meter in accordance with claim 8, further comprising:

a first temperature sensor arranged on said pressure case and measurable of temperatures effecting a distance between said joint ends of said flow tubes;

a second temperature sensor arranged on one of said flow tubes and said manifolds, said
 5 second temperature sensor being measurable of temperatures effecting rigidity of said flow tubes.


Claim 11 has not been amended by this amendment and remains as follows:

11. A meter in accordance with claim 5, wherein:

said each curve is continuous from said first joint end to said second joint end.

Please add the following new claim:


12. (NEW) A Coriolis mass flow meter comprising:



 5 an entry-side manifold with an inlet portion and integral first inlet branch and integral second inlet branch, said inlet portion extending in an axial direction, said first inlet branch bending to terminate at a first inlet branch end with a first inlet connection direction at an acute angle to said axial direction, said second inlet branch bending to terminate at an second inlet branch end with a second inlet connection direction at an acute angle to said axial direction;

an exit-side manifold with an outlet portion and integral first outlet branch and integral second outlet branch, said outlet portion extending substantially in said axial direction, said first inlet branch bending to terminate at a first inlet branch end with a first inlet connection direction
 10 at an acute angle to said axial direction, said second inlet branch bending to terminate at an

second inlet branch end with a second inlet connection direction at an acute angle to said axial direction;

a first arched flow tube having a curve in only one direction and lying in a first plane, said first arched flow tube extending from a first joint end to a second joint end;

15 a first arched flow tube having a curve in only one direction and lying in a first plane, said first arched flow tube extending from a first arched flow tube first joint end to a first arched flow tube second joint end, said first arched flow tube first joint end being along said first inlet connection direction and being connected to said first inlet branch end and said first arched flow tube second joint end being along said first outlet connection direction and being

20 connected to said first outlet branch end;


25 a second arched flow tube having a curve in only one direction and lying in a second plane, said second arched flow tube extending from a second arched flow tube first joint end to a second arched flow tube second joint end, said second arched flow tube first joint end being along said second inlet connection direction and being connected to said second inlet branch end and said second arched flow tube second joint end being along said second outlet connection direction and being connected to said second outlet branch end, said first plane and said second plane being substantially parallel;

a drive unit for driving and resonating said first arched flow tube with respect to said second arched flow tube at mutually opposite phases;

30 a pair of oscillation sensors installed at locations symmetrical with respect to said drive unit for sensing a phase difference proportional to a Coriolis force of fluid in said two flow

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tubes.

REMARKS

Claims 1 - 12 are in this application and are presented for consideration. By this Amendment Applicant has made changes to claim 1. Additionally new claim 12 has been added. Applicant respectfully requests that the Examiner reconsider the rejections in view of the revision of claim 1 and favorably consider new claim 12.

Claims 1 - 11 have been rejected as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Applicant has now revised claim 1 and has made changes to address the issues raised by the Examiner. However, it is not clear as to why the other claims are also rejected (claims depending on claim 1 may be rejected but it is believed that other claims are not). It is Applicant's position that revised claim 1 and claims depending thereon are now clear and definite and fully conform with the requirements of the statute.

Claims 1 - 11 have been rejected as being obvious based on the teachings of each of Cage et al. (U.S. 4,876,898) in view of Lew et al. (U.S. 5,663,509) and further in view of Keita (U.S. 5,796,011). It appears Cage et al. is cited primarily for a manifold with connections to multiple flow tubes while Lew et al. is cited for parallel conduits joined to manifolds and Keita et al. is cited for the shape of the tubes. However, it is Applicant's position that these various teachings do not direct or motivate the person of ordinary skill in the art toward the combination claimed.

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